

Appl. No. 10/709,663
Amdt. dated November 23, 2004
Reply to Office action of August 30, 2004

REMARKS/ARGUMENTS

Objection to the title of the invention being not descriptive:

- 5 The title of the invention is amended as per AMENDMENTS TO THE SPECIFICATION heading above. The title is amended to better reflect the claims. No new matter is introduced.

Objection to the typographical error in the specification:

- 10 The specification is amended as per AMENDMENTS TO THE SPECIFICATION heading above. The typographical error of "IS" in the specification is corrected. No new matter is introduced.

15 Amendments to claims 3 and 6:

In addition to amendments detailed below, claims 3 and 6 are revised to recite "consisting of" rather than "comprising". This is done to properly claim the alternative selection in closed form. No new matter is entered.

- 20 Objection to claim 3:

- Claim 3 is amended as per AMENDMENTS TO THE CLAIMS heading above. The repeated "indium tin oxide" is revised to "antimony tin oxide" as per claim 6. No new matter is introduced.

25 Rejection of independent claims 1 and 4:

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Independent claims 1 and 4 are amended to include the limitation of the amorphous interface layer being **conductive**, as was already recited in claims 3 and 6, respectively. Conversely, claims 3 and 6, by virtue of their respective dependence on claims 1 and 4,
5 no longer need to recite that the amorphous interface layer is conductive. As such, claims 3 and 6 are amended to delete the limitation of the amorphous interface layer being conductive. No new matter is introduced by these amendments.

In view of the amendments to claims 1 and 4 described above, the applicant believes that
10 the amended claims 1 and 4 are patentable under 35 U.S.C 103(a). Supporting arguments are provided below.

The examiner states in his rejection of claims 3 and 6 (refer to Office Action, page 5, lines 5-13) that although Yang's (US 6,709,883) amorphous interface layer is not
15 conductive, it would have been obvious for someone skilled in the art to make it conductive. The applicant respectfully disagrees and explains the reasons for doing so below.

Unlike Yang, whose LED contains a p-type ohmic contact epitaxial layer (refer to Yang
20 Fig. 1 and col. 3, lines 6-7), the claimed invention's LED has no such layer (refer to Fig. 1). The claimed invention, by making the amorphous interface layer conductive, creates an unexpected and unobvious result. It allows for the elimination of the prior art's epitaxial contact layer.

25 Please refer to the applicant's Fig. 1. The conductive amorphous interface layer 11 permits electric current to pass from the electrode 20 to the p⁺-type contact layer 12 and eventually reach the MQW light emitting layer 14. If the amorphous interface layer was not conductive, like in the prior art, electric current would not be able to pass as described above. This would create the need for an epitaxial contact layer (such as Yang's) to be

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grown on top of the non-conductive amorphous interface layer in order for electric current to travel from the electrode to the light emitting layer.

- 5 Consequently, the claimed invention eliminates the need for forming an epitaxial contact layer, and in doing so reduces the cost of manufacturing, as well as the complexity of the light emitting diode. Moreover, the motivation for providing a transparent conductive layer to Yang's device is insufficient since Yang already provides a p-type ohmic contact epitaxial layer that provides "not only for adhesion to the first substrate but also provide 10 conductivity with low resistance and low sheet resistance" (examiner's statement of motivation, Office Action, page 5, lines 11-13). That is, making Yang's amorphous interface layer conductive would be redundant.

15 It can be further argued that Yang's transparent adhesive layer cannot be conductive and must be insulating. Yang's invention shows the ohmic metal layers 28 and 30 being formed on the same end of the chip, in order to handle the current being blocked by a insulating adhesive layer. However, with the transparent substrate 10 already being conductive, if Yang were also to make his adhesive layer 14 conductive, this signifies that 20 the ohmic metal layers 28 and 30 would have to be on opposite ends of the chip. This is not shown by any of Yang's embodiments.

Furthermore, Yang didn't disclose that the transparent adhesive layer could be made from 25 a conductive material. Yang solely disclosed that the material of the transparent adhesive layer is BCB or epoxy (Yang, col. 3, lines 46-51). However, both BCB and epoxy are insulating materials.

In view of these arguments, it is believed that claims 1 and 4 satisfy the novelty and unobviousness requirements and should be allowable under both 35 U.S.C 102(e) and 35 U.S.C 103(a). Hence, reconsideration of claims 1 and 4 is requested in view of the

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amendments to claims 1 and 4 and the above explanation.

Rejection of dependent claims 2, 3, 5 and 6:

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Claims 2 and 3 are dependent on claim 1 and should be allowed if claim 1 is found allowable. Claims 5 and 6 are dependent on claim 4 and should be allowed if claim 4 is found allowable. Reconsideration of claims 2, 3, 5 and 6 is requested in view of the amendments to claims 1 and 4 and corresponding explanation.

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Sincerely yours,

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